

## Description of a New Species of the Genus *Crepidodera* (Coleoptera, Chrysomelidae, Alticinae) from Honshu, Japan

Kunio SUZUKI

Department of Biology, Faculty of Science, Toyama University,  
3190 Gofuku, Toyama-shi, 930–8555 Japan

**Abstract** A new species of the genus *Crepidodera* is described from Honshu, Japan, under the name of *Crepidodera yahiroi*. This new species is easily distinguished from other known Japanese species by the following several morphological characteristics: smaller body, oblong-oval body form, dark yellowish brown 1st antennal segment with the anterior and upper surface of its central 2/3 area largely pale brownish black, dark brownish brown tibiae of all legs except for the apical halves dark yellow, and aedeagus with the apex truncated. Discussion on the geographical distribution and the host plants of this new species is given in comparison with those of the known Japanese *Crepidodera* species.

When I had an opportunity to examine many chrysomelid specimens preserved in the insect collections of the Lake Biwa Museum, Kusatsu-shi, Shiga Pref., through the courtesy of Dr. Kazuhiro MASUNAGA, I found a series of strange small alticine specimens collected from two places located in the vicinity of Lake Biwa by Dr. Katsuro YAHIRO of the museum. Based on a detailed comparative study of them with many specimens of this genus collected from various districts of Japan, I reached the conclusion that those specimens obviously belonged to the genus *Crepidodera* and should be regarded as a new species. I myself tried to survey the populations of the species in question with my young friend Ms. Yoko MATSUMURA and collected a number of additional specimens. Classification of the Japanese species of the genus *Crepidodera* is still in confusion but the identity of this new species is very distinct. Therefore, first of all I am going to describe this new species. Furthermore, I would like to discuss on some problems of its geographical distribution that should be quickly resolved.

*Crepidodera yahiroi* K. SUZUKI, sp. nov.

[Japanese name: Yahiro-midori-tobi-hamushi]

(Figs. 1–4)

This new species looks like small-sized *Altica* and medium-sized *Psylliodes* species because of their peculiar oblong-oval body form and cyaneous dorsal coloration and is easily distinguished from the known Japanese *Crepidodera* species by the following several characteristics: smaller body, oblong-oval body form (nearly par-

allel-sided body in both *C. sahalinensis* KONSTANTINOV, 1966 and *C. japonica* BALY, 1877), almost evenly metallic cyaneous dorsum, dark yellowish brown basal four antennal segments with the anterior and upper surface of the central 2/3 area of the 1st one largely pale brownish black (ordinarily almost light yellow basal four, very rarely basal five, antennal segments in *C. sahalinensis*; almost dark yellow to reddish or brownish yellow basal five to seven antennal segments in *C. japonica*), strongly convex pronotum narrowed anteriorly with the posterior halves of lateral sides nearly straight (weakly convex pronotum with the anterior corners weakly projected anteriorly in *C. sahalinensis*; strongly convex pronotum not narrowed anteriorly with the anterior corners strongly and sharply projected outwardly in *C. japonica*), almost dark brownish to pitchy black femora of all legs (almost dark yellowish to dark reddish, very rarely brownish black, fore and mid femora in *C. sahalinensis*; dark reddish black femora of all legs in *C. japonica*), dark yellowish brown to dark reddish to brownish black tibiae with dark to light color gradation from the bases to the apices (light yellow to somewhat dark yellowish brown tibiae, rarely anterior halves thicker in coloration, in *C. sahalinensis*; almost dark yellowish brown to brown fore tibiae with dark to light color gradation from the apices to the bases in *C. japonica*), considerably densely pubescent on almost whole abdominal sternites except for the basal half area of metasternum (considerably sparsely pubescent on whole abdominal sternites in *C. sahalinensis*, densely pubescent on whole abdominal sternites with a peculiar (especially in ♂, much weaker in ♀) U-shaped long-haired bunch in the central area of the 1st abdominal sternite in *C. japonica*), ♂ genitalia with the apex nearly truncated, ♀ spermathecal organ with the distal part of spermathecal capsule long and ventrally curved, and so on.

Body smaller in size among the genus *Crepidodera* and somewhat oblong-oval in body form.

Body coloration:— General color of dorsal surface metallic cyaneous, sometimes with bluish or greenish, very rarely purplish, luster on pronotum and/or on whole dorsal surface. Undersurface almost completely dark bluish black. All femora almost dark brownish black, fore and mid femora sometimes dark reddish brown; all tibiae dark yellowish brown to dark reddish to brownish black with dark to light color gradation from the bases to the apices; all tarsi light yellow to slightly brownish yellow with claws light brownish. Head capsule almost slightly dark metallic cyaneous except for eyes; clypeus and labrum almost metallic black; mandibles metallic pitchy black with the apical 1/3 reddish brown to brownish black; maxillary and labial palpi dark reddish brown; antennae — 1st to 4th segments basically pale yellow to dark yellowish brown, 5th to 11th segments distinctly almost brownish to pitchy black, with the anterior and upper surface of the central 2/3 area of the 1st segment brownish black, 2nd and 3rd segments light yellowish brown, 4th segment light yellowish brown with the apical half light brownish, 5th segment brownish black with the base light brownish, 6th to 11th almost completely brownish black.

Head:— Surface of vertex nearly smooth, impunctate, very fine granulations scattered on whole area recognizable under high magnification; frontal tubercles (antennal



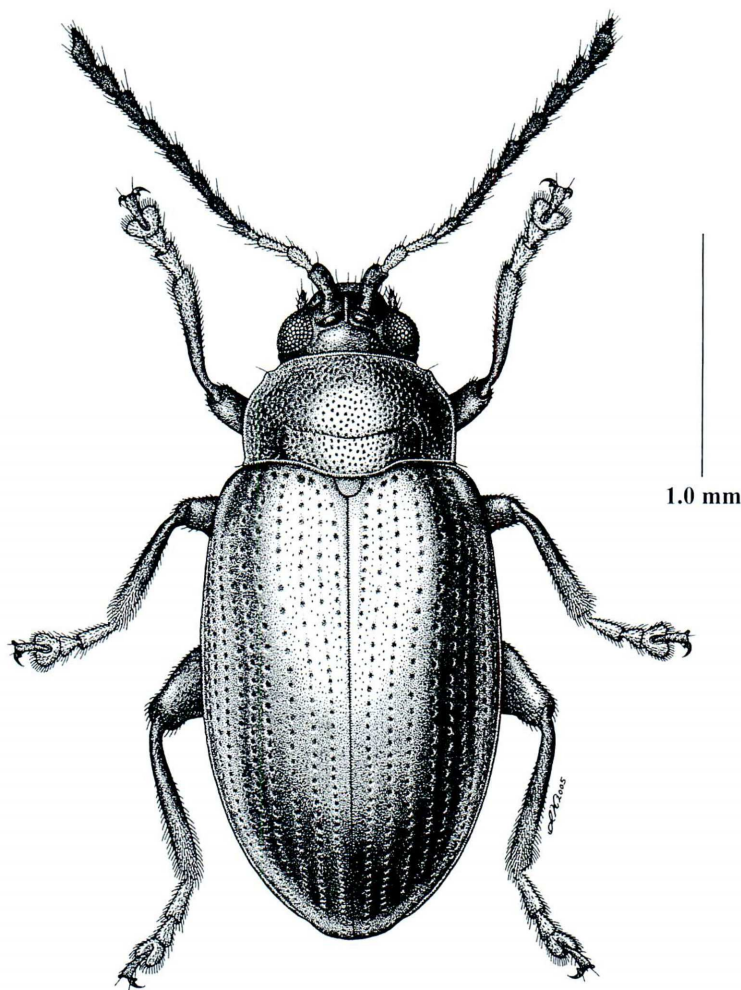
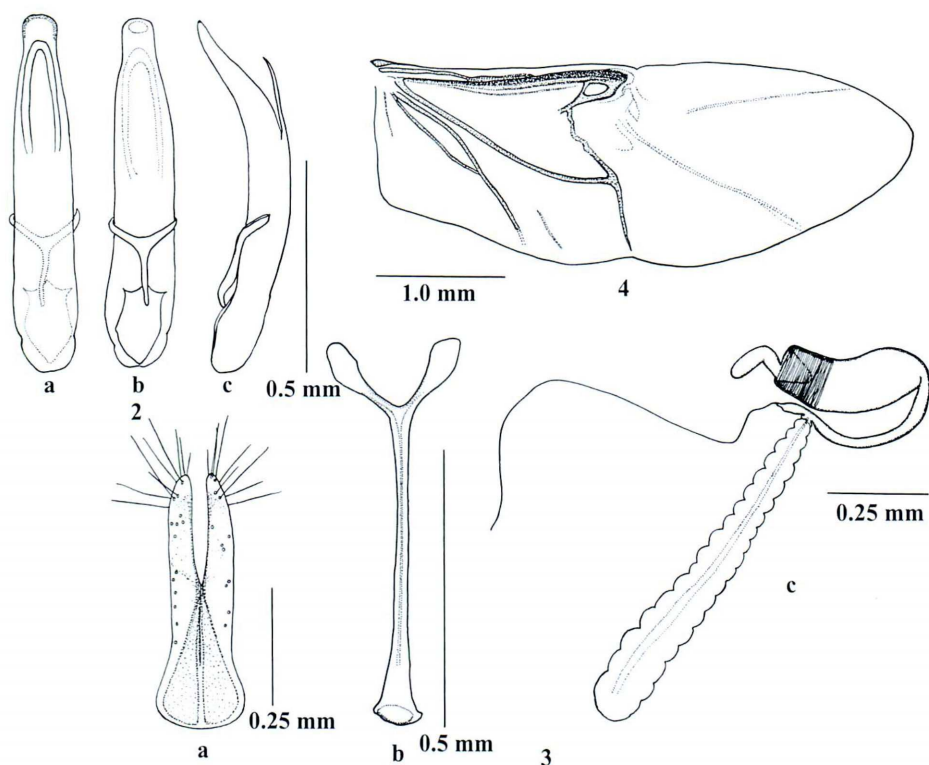


Fig. 1. *Crepidodera yahiroi* K. SUZUKI, sp. nov. (holotype, ♂), from Adogawa-chô (Yotsugawa), Takashima-gun, Shiga Pref., Kinki District, Honshu.

calli) subpentagonal, glabrous, weakly raised but distinctly bordered; frontal ridge distinctly raised with several whitish bristle-like long hairs on both sides; clypeus transverse with the front margin gently curved anteriad and several whitish bristle-like long hairs along the basal line, finely shagreened on whole surface. Mouth-parts:— Labrum transverse, with the front margin very weakly curved anteriad, with a row of six whitish bristle-like long hairs along and slightly under the central transversal line; maxillary palpi slender, three segments nearly equal in both length and maximum width, with the last segment strongly elongated conical with bluntly pointed apex. Eyes large. Antennae filiform, more than half (about 3/5) the length of body; 1st seg-



Figs. 2–4. *Crepidodera yahiroi*. — 2, Male genitalia (a, dorsal, b, ventral, c, lateral views); 3, female genitalia (a, styli, b, tignum, c, spermathecal organ); 4, right hind wing (♀).

ments very strongly thickened and nearly twice as long as the width, 2nd segments with the outer margin slightly curved anteriorly, 2nd to 4th segments nearly equal in length, shorter than 1st ones, and 11th segment the longest with the apices bluntly projected.

Pronotum subquadrately, narrowed anteriorly, the widest at the middle, about  $2/3$  as long as the width; dorsum strongly transversely convex especially in the anterior half area; distinctly punctured in whole area, with the distinct ante-basal transverse impression, which is weakly curved posteriorly at the middle, near the basal margin, bounded on either side by short but deep ante-basal longitudinal impressions; front margin nearly straight with the corners rounded and projected anteriorly; lateral margins becoming narrower anteriorly and their basal halves nearly straight. Scutellum glabrous, with the lateral margin gently curved outwards.

Elytra elongate, about 1.35 times as long as the width, lateral margins not parallel, gently curved outwards, the widest near the middle; dorsum convex, humeral calli distinct and protruded anterolaterally with the inner edges bordered by eight to nine large punctures constituting the 6th elytral striae, regularly and rather deeply punctate in ten

longitudinal rows on each elytron, 1st rows, the so-called scutellar rows, short and terminate at the point 1/3 from the bases, 2nd to 10th rows reaching near the apices, interstices of these regular longitudinal rows of large punctures sparsely bearing very fine pubescent-punctures.

Undersurface pubescent in nearly whole area except for the basal half area of metasternum.

Male genitalia (Fig. 2) simple, well sclerotized, gently curved ventrad, with the apex nearly truncated, anterior opening small, and tegmen well sclerotized and Y-shaped.

Female genitalia (Fig. 3):—Vaginal palpi (Fig. 3 a) and tignum (Fig. 3 b) (=styli, in part *sensu* KONSTANTINOV, 1994) are illustrated here because these structures will be useful for future comparative study of *Crepidodera*-species. Spermathecal organ (Fig. 3 c) one of typical alticine ones; spermathecal capsule well sclerotized with a distinct apex; outer surface of distal 1/3 with many transverse folds, the base of proximal part strongly transformed, lengthened and curved inwardly; spermathecal duct slender, more than twice as long as the capsule length, uniform in width through its whole length; spermathecal gland simple, less than twice as long as the capsule length.

Hind wing venation (Fig. 4):—Typical venation in the Alticinae, considerably reduced.  $Cu_{1a}$  very much reduced, still visible but almost vestigial, completely isolated from  $Cu_{1b}$  because of a complete loss of  $cu_{1a}$ - $cu_{1b}$ -crossvein.

*Measurement in mm.* Body length (from anterior margin of frons to elytral apices): ♂, 2.20–2.95; ♀, 2.40–3.00. Maximum width of head (including eyes): ♂, 0.50–0.65; ♀, 0.50–0.65. Antennae length: ♂, 1.35–1.75; ♀, 1.35–1.75. Pronotum length (along the mid-line): ♂, 0.40–0.60; ♀, 0.40–0.60. Maximum width of pronotum: ♂, 0.75–1.05; ♀, 0.80–1.05. Elytra length: ♂, 1.60–2.15; ♀, 1.80–2.15. Elytra width: ♂, 1.15–1.45; ♀, 1.20–1.50. Hind tibiae length: ♂, 0.55–0.70; ♀, 0.55–0.70. Relative length of each of 1st to 11th antennal segments to 1st segment (no conspicuous difference in both sexes): 1.00 : 0.65 : 0.65 : 0.65 : 0.80 : 0.60 : 0.80 : 0.75 : 0.85 : 0.80 : 1.05.

*Type series.* Holotype: ♂ (NSMT-I-C2000108), allotype: ♀, Adogawa-chô (Yotsugawa) [N35°18', E136°03'], Takashima-gun, Shiga Pref., Kinki District, Honshu, Japan, 19–VIII–2005, K. SUZUKI & Y. MATSUMURA leg. Paratypes, all of which were collected in Shiga Pref., Honshu: 13♂♂, 10♀♀, same data as for the holotype; 12♂♂, 13♀♀, Matsunoki-naiko [N35°18', E136°03'], Adogawa-chô (Yotsugawa), 22–IV–2000, K. YAHIRO leg.; Imazu-chô (Kitoge-Higashi) [N35°25', E136°16'], Takashima-gun, 19–VIII–2005, K. SUZUKI & Y. MATSUMURA leg.; 1♂, 1♀, Kinomoto-chô (Akao) [N35°28', E136°13'], Ika-gun, 27–VIII–2005, K. SUZUKI & Y. MATSUMURA leg.; 13♂♂, 9♀♀, Kohoku-chô (Ebie) [N35°25', E136°13'], Higashi-Azai-gun, 27–VIII–2005, K. SUZUKI & Y. MATSUMURA leg.; 6♂♂, 11♀♀, Biwa-chô (Yagihama) [N35°22', E136°15'], Higashi-Azai-gun, 27–VIII–2005, K. SUZUKI & Y. MATSUMURA leg.; 1♂, 2♀♀, Biwa-chô (Hayazaki-naiko), Higashi-Azai-gun, 25–X–2005, Y. KITSUKI leg.; 3♂♂, 2♀♀, Biwa-chô (Anegawa-Ôhashi), Higashi-Azai-gun, 25–X–2005, Y. KI-



TSUKI leg.; 134♂♂, 111♀♀, Sumai-chô [N35°25', E136°15'], Nagahama-shi, 27–VIII–2005, K. SUZUKI & Y. MATSUMURA leg.; 18♂♂, 15♀♀, Matsubara-chô [N35°17', E136°15'], Hikone-shi, K. SUZUKI & Y. MATSUMURA leg.; 5♂♂, 3♀♀, Imahama-chô (Nagisa-Kôen) [N35°04', E136°00'], Moriyama-shi, 26–IX–2005, K. SUZUKI & Y. MATSUMURA leg.; 1♂, 1♀, Shimomono-chô (Karasuma-Hantô) [N35°03', E135°58'], Kusatsu-shi, 6–VII–1999, K. YAHIRO leg.; 7♂♂, 1♀, Niihama-chô [N35°00', E135°55'], Kusatsu-shi, 26–IX–2005, K. SUZUKI & Y. MATSUMURA leg.

The holotype, allotype and several paratypes are deposited in the collection of the Department of Zoology, National Science Museum (Nat Hist.), Tokyo. Most paratypes collected by Dr. K. YAHIRO and by Mr. Y. KITSUKI will be preserved in the Lake Biwa Museum, Kusatsu-shi, Shiga Pref. and Mr. KITSUKI's private collection, respectively, after the publication of this paper. Though a part of the paratypes will be donated to several museums and several professionals of alticine systematics of Japan and several foreign countries, most remaining paratypes will be preserved in my private collection, now deposited in my laboratory at the Department of Biology, Faculty of Science, Toyama University.

*Distribution.* Honshu (Shiga Pref.; Kinki District), Japan.

*Etymology.* This species is named in honor of the first collector Dr. Katsuro YAHIRO.

*Host plants.* *Salix chaenomeloides* KIMURA (Salicaceae) [Japanese name: Akame-yanagi], several species of *Salix*.

*Notes on the geographical distribution and the host plants* (Fig. 5). After I found many specimens of this new species in the collection of the Lake Biwa Museum, Ms. Y. MATSUMURA and I tried to survey many places in the vicinity of Lake Biwa and its neighboring areas three times from August to September in 2005 and collected a number of additional individuals at nine localities. Most of the individuals were collected on *Salix chaenomeloides*. This plant preferably grows on a flood plain of a large river, marshy land and the vicinity of lakes and ponds and occasionally constitutes one of dominant species among the genus *Salix*. However, we collected several individuals of this new species also on some *Salix* species other than *S. chaenomeloides*. On the other hand, *Salix chaenomeloides* has been known as a main host plant of *Crepidodera sahalinensis* (cf. OHNO, 1999; SATO & TAKIZAWA, 2000). We collected a number of individuals that can be identified as those belonging to *C. sahalinensis* on *Salix* species other than *C. chaenomeloides* at several places in the vicinity of Lake Biwa. We observed that *C. yahiroyi* and *C. sahalinensis* inhabited completely sympatrically at several very restricted sites in the vicinity of Lake Biwa; i.e., the former species were mainly collected on *Salix chaenomeloides* and the latter mainly on other *Salix* species. In our impression in the field survey, a kind of habitat segregation seems to exist between these two co-existing *Crepidodera* species.

Besides a number of specimens of the type series, I examined only one specimen, which obviously belonged to the new species, collected at somewhere (detailed data not available) in the Ki-no-kawa River System. The river flows through Nara and

Wakayama Prefectures, Kinki District. Therefore, I infer that this new species may be widely distributed in the Kinki District including the Kii Peninsula and its neighboring regions. I also expect that the geographical distribution of this new species will be promptly elucidated.

Concerning *Crepidodera sahalinensis* I would like to mention briefly here about my private experience, indeed, I had already collected a number of individuals of this species more than 40 years ago at Tsunashima in Yokohama-shi, Kanagawa Pref., Kantô District, which is located in a lowland area of central Honshu. Prof. Emeritus M. OHNO examined those specimens at that time. He also commented that they were clearly different from two known Japanese species, *C. japonicus* and *C. plutus picipes* (WEISE, 1887) [= *C. picipes*: KONSTANTINOV, 1996] and concluded that they should belong to a new species (cf. OHNO, 1999). Regrettably, the species has never been described since then until today (cf. OHNO, 1999). SATO and TAKIZAWA (2000) regarded those specimens as the same as one of the two *Crepidodera* species, *C. japonica* and *C. sahalinensis*, occurring in Tochigi Pref., Kantô District, northern Honshu. They identified them as the latter species *C. sahalinensis* that KONSTANTINOV described in 1996 based on several specimens from Sakhalin. According to SATO and TAKIZAWA these two species show considerably distinct allopatric distribution, though they occurred sometimes sympatrically with each other. Ms. MATSUMURA and I have also confirmed fundamentally the same situation in several localities of the Hokuriku District, central Honshu (SUZUKI & MATSUMURA, unpublished).

Ms. MATSUMURA and I also found the coexistence of this new species with a congener at several sites in the vicinity of Lake Biwa, the latter of which can be identified with *C. sahalinensis* at present, in the following localities: Imazu-chô (Takashima-gun), Kinomoto-chô (Ika-gun), Kohoku-chô and Biwa-chô (Higashi-Azai-gun), Nagahama-shi, Moriyama-shi, and Kusatsu-shi (Fig. 5). All known species of the genus *Crepidodera* feed on the plants of several genera of the Salicaceae, especially preferably on various *Salix* species. In our impression in the field survey, the two species in question seem to show a kind of habitat segregation concerning their host plants. In Sumai-chô (Nagahama-shi), only one individual belonging to *C. sahalinensis* was found among more than 250 individuals of this new species. *Salix chaenomeloides* was overwhelmingly dominant there. However, host preference among closely related herbivorous insect species is occasionally and complicatedly influenced by the floral difference of the habitat in question as, for example, SUZUKI and UÉHARA (1998) reported for attelabid species. At any rate a detailed survey on the actual condition between these two *Crepidodera* species should be made in the near future.

Comprehension of geographical distribution of this new species is important for discussing the speciation of this genus in Far East Asia including Japan because there are more than one other undescribed species at my hands and at least three different species groups of the genus seem to be distributed in the Japanese Archipelago (SUZUKI, in preparation).

*Notes on the intraspecific variation of body coloration.* Body coloration of this



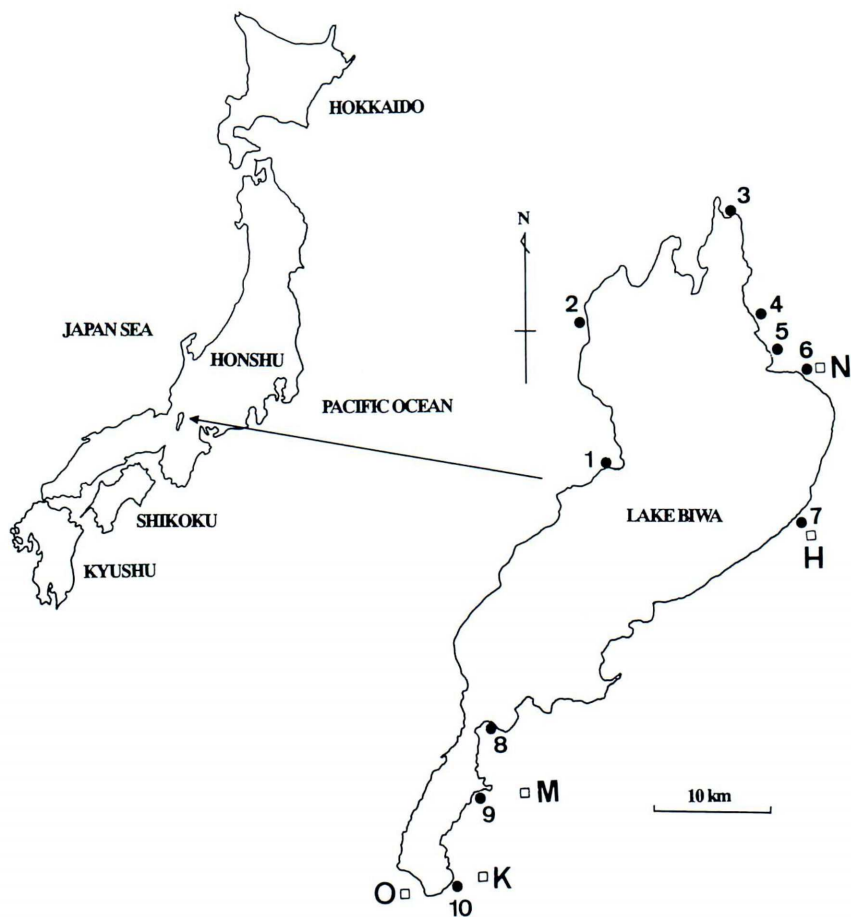


Fig. 5. A map showing the known localities of *Crepidodera yahiroi*. Arabian numerals on a map show the localities as follows: 1. Adogawa-chô (Yotsugawa), Takashima-gun; 2. \*Imazu-chô (Kitoge-Higashi), Takashima-gun; 3. \*Kinomoto-chô (Akao), Ika-gun; 4. \*Kohoku-chô (Ebise), Higashi-Azai-gun; 5. \*Biwa-chô (\*Yagihama, \*Anegawa-Ôhashi and \*Hayazaki-naiko), Higashi-Azai-gun; 6. \*Sumai-chô, Nagahama-shi; 7. Matsubara-chô, Hikone-shi; 8. \*Imahama-chô (Nagisa-Kôen), Moriyama-shi; 9. Shimomono-chô (Karasuma-Hantô), Kusatsu-shi; 10. \*Niihama-chô, Kusatsu-shi. The localities with asterisks show known co-existing places of two *Crepidodera* species, *C. yahiroi* and *C. sahalinensis*. □: Main cities — H, Hikone, K, Kusatsu, M, Moriyama, N, Nagahama, O, Ohtsu.

new species is considerably stable. Dorsum is generally metallic cyaneous in most individuals. In some individuals pronotum and sometimes together with elytra show evenly or rarely partly greenish, purplish, and/or red-purplish luster.

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I wish to express my hearty thanks to the following persons: Dr. K. YAHIRO and



Dr. K. MASUNAGA (Lake Biwa Museum, Kusatsu) kindly gave me an opportunity to examine valuable specimens of this interesting species; Dr. Shun-Ichi UENO (National Science Museum (Nat. Hist.), Tokyo) kindly made a critical reading of the manuscript; Ms. Y. MATSUMURA (Toyama University) devotedly assisted me in various ways; Prof. Emerit. Yoshiaki KOMIYA (Tokyo) and Dr. Haruo TAKIZAWA (Hasuda) fully supported my taxonomic study of the Japanese *Crepidodera* species; Dr. A. S. KONSTANTINOV (National Museum of Natural History, Washington, D.C.) generously sent me his valuable writings with deep friendship; Mr. Yoshimichi KITSUKI (Tokyo) kindly offered several valuable specimens; Mr. Itsuro KAWASHIMA (Yokosuka) exhausted his energy in drawing a beautiful habitus of the holotype specimen of *Crepidodera yahiroi*.

## 要 約

鈴木邦雄：本州産ミドリトビハムシ属 *Crepidodera* の1新種の記載。—— 滋賀県の琵琶湖周辺地域の10カ所から得られたミドリトビハムシ属 *Crepidodera* (ハムシ科, トビハムシ亜科) の1新種を, *C. yahiroi* の名のもとに記載した。和名は, 学名を献名し, 本種の最初の採集者である琵琶湖博物館の八尋克郎氏に因んで「ヤヒロミドリトビハムシ」としたい。本種は, 本属の他種が, いずれも体側が略平行で細長いのに比べ, 体形が略卵形で, 体色も全体に青藍色が強く, 一見したところカミナリハムシ属 *Altica* の小型種やスネナガトビハムシ属 *Psylliodes* の中型種を思わせる外見をもつ (体背面の色彩変異については, 本文中に記述)。本属は全北区に広く分布し, いずれもヤナギ科植物を寄主としているが, 本種は, 琵琶湖周辺地域では, おもにマルバヤナギ *Salix chaenomeloides* KIMURA を寄主としている。日本産の本属の種の分類は混乱しており, 北海道と本州の山地帯に広く生息するニホンミドリトビハムシ (改称) *C. japonica* BALY, 1877 1種に属するとする見解のほか, 他にやはり山地性のホソミドリトビハムシ *C. plutus picipes* (WEISE, 1887) [= *C. picipes*: KONSTANTINOV, 1996] なる種も存在するとする2種説, さらに本州の関東地方の平野部などから知られている個体群が近年樺太から記載された *C. sahalinensis* KONSTANTINOV, 1996 なる種に相当する (学名の確定以前に和名先行でスズキミドリトビハムシ *Crepidodera* sp. として報告された) という3種説が提唱されるなど, ひじょうに混乱してきた。前2者の関係はいまだに不明瞭で結着がついていない。スズキミドリトビハムシについても, その地理的分布の詳細は不明で, 関東地方以外の地域から得られている個体群のすべても同種に属するの否か, 現時点では不明瞭である。私は, 現在, 樺太や千島産のものを含め, 日本各地の多数の標本に基づいて本属の分類学的再検討を行なっているが, 日本産の本属は少なくとも5種以上から構成される可能性が高いと推測している。ここで新種として報告するヤヒロミドリトビハムシは, 従来知られている本属の他種とは多くの点でかなり異質の特徴を持つと同時に, 日本列島における本属の種分化を解明するうえで重要な鍵を握っていると考えられるため, 取り敢えず記載報告しておくことにした。なお, 私は, 詳細な採集データの不明な, 奈良県~和歌山県を流れる紀ノ川水系産の標本を1個体検しているのので, 本新種は, 今後, 近畿地方とその周辺地域の平野部の河川敷などに生育するヤナギ類, とくにマルバヤナギとその近縁種を中心に詳しく調べることによって, 各地から得られる可能性が高いものと推測している。

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